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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/530,471	04/06/2005	Kouji Muramoto	P27669	5344

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EXAMINER
DUONG, THANH P

ART UNIT	PAPER NUMBER
1764	

NOTIFICATION DATE	DELIVERY MODE
08/23/2007	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/530,471	MURAMOTO ET AL.	
	Examiner	Art Unit	
	Tom P. Duong	1764	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-7 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-7 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 06 April 2005 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Tom Duong
8/15/07

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date 7/6/05.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 1 and 4-5 are rejected under 35 U.S.C. 102(b) as being anticipated by Japanese Publication Number 2000-161647 ("JPN '647").

Regarding claim 1, JPN '647 discloses an exhaust gas processing device (Fig. 8) comprising: an air preheater (3) for preheating air for combustion in a combustion device (1) by using an exhaust gas emitted from the combustion device (1); a gas-gas heater heat recovery device (4) composed of a heat transfer tube (Fig. 1) for recovering the heat of the exhaust gas at the outlet of the air preheater to a heat medium (section 0003); a dust collector (5) for collecting dust (Section 0003) in the exhaust gas at the outlet of the gas-gas heater heat recovery device (4); a wet-type desulfurization device (7) for removing sulfur oxide (Section 0003) in the exhaust gas at the outlet of the dust collector (5); a gas-gas heater re-heater (8) composed of a heat transfer tube (Section 0008) for heating the exhaust gas at the outlet of the wet-type desulfurization device (7) by using the heat medium supplied from said gas-gas heater heat recovery device (4), being arranged in that order from the upstream side to the downstream side of an exhaust gas duct of the combustion device (1); and a heat medium circulation line (Fig.

8, circulation line between GGH heat recovery machine 4 and GGH reheater 8) for connecting heat transfer tubes provided in each of the gas-gas heater heat recovery device and the gas-gas heater re-heater and for circulating the heat medium through the heat transfer tubes (Section 0011), wherein the heat transfer tube of the gas-gas heater heat recovery device (4) is squarely arranged in the gas flow direction (Figs. 1, 3, 4-7, 16-17) in such a manner that the inter-tube flow rate, which is the flow rate of the exhaust gas between the heat transfer tubes adjacent in the direction orthogonal to the gas flow direction, can be 10 m/s or lower (Section 0027).

Regarding claim 4, JPN '647 at least three stages (12-1, 12-2, 12-3) of the heat transfer tubes composed of a bare tube (12-1) are installed on the stage preceding the fin-equipped heat transfer tubes of the gas-gas heater re-heater (Figs. 3-6), and said bare tube is staggered arrangement in the gas flow direction so that the inter-tube flow rate, which is the flow rate of the exhaust gas between the heat transfer tubes adjacent in the direction orthogonal to the gas flow direction, cannot be more than 12 to 16 m/s (Sections 0026-0027).

Regarding claim 5, JPN '647 discloses the heat transfer tubes composed of the bare tube (12-1) installed in the stage preceding the fin-equipped heat transfer tubes of the gas-gas heater re-heater are either made a part of the heat medium circulation line (Fig. 8, circulation line between GGH heat recovery machine (4) and GGH reheater (8) for circulating the heat medium through the gas-gas heater heat recovery device (4) and the gas-gas heater re-heater (8), or made a steam line for flowing steam that is installed separately from said heat medium circulation line (Figs. 14-15).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over JPN '647 in view of Iwashita et al. (6,096,279). JPN '647 discloses a dust collector but does not disclose a specific dust collector of a wet type disposed between the wet-type desulfurization device and the gas-gas heater re-heater in the exhaust gas duct. Iwashita et al. teaches that it is desirable provide a wet type dust collector downstream of absorption tower 13 or wet-type desulfurization device and upstream of the reheating section 5 GGH in order to achieve a high degree of purification of the flue gas (Col. 3, lines 31-38). Thus, it would have been obvious in view of Iwashita et al. to one having ordinary skill in the art to provide a wet type dust collector as taught by Iwashita et al. in the device of JPN '647 in order to achieve a high degree of purification of the flue gas.

3. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over JPN '647 in view of Japanese Publication Number 09-280540 ("JPN '540"). JPN '647 disclose a gas-gas heater and gas-gas heater re-heater with fin-equipped heat transfer tubes but

is silent with respect to the fin pitch. JPN '540 teaches that it is desirable to provide a heat exchanger (Abstract) with fin pitch set within 8-10 mm. Such configuration provides minimum pressure loss in the system and minimizes dust blockage in the system (Section 0009). Thus, it would have been obvious in view of JPN '540 to one having ordinary skill in the art to provide the fin pitch ranges as taught by JPN '540 in the heat transfer tubes of GGH recovery device and GGH heater re-heater of JPN '647 in order to optimize pressure loss and minimize dust blockage in the system.

4. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over JPN '647 in view of Japanese Publication Number 2000-304238 ("JPN '238"). JPN '647 essentially discloses the features of the claimed invention except a dust removers disposed in front and back of the tube bundles. JPN '238 teaches that a soot blower 18 (Fig. 1) with lance 16 or dust remover is provided between the heat transfer tubes to facilitate in removing soot which adheres to the heat transfer tubes. Thus, it would have been obvious in view of JPN '238 to one having ordinary skill in the art to modify the device of JPN '647 with dust removers as taught by '238 in order to remove dust from the heat transfer tubes, which prevent reduction of heat transfer efficiency (Abstract). With respect to the configuration of the number of stages of the heat transfer tubes with a width of 3000 mm or less, JPN '647 discloses plurality of stages, three stages (12-1, 12-2, 12-30 and) and it appears that JPN '647 discloses the width of the three stages are less than 3000 mm or less being the fact the number of stages (three stages) in JPN '647 is much less than the required claimed eight stages. Furthermore, Applicants

disclose a preferred embodiment of heat transfer tubes of no more than eight stages with a width of 3000 mm or less (specification page 11, last paragraph) and it appears that JPN '647 discloses the heat transfer tubes with three stages (12-1, 12-2, 12-3) much less than the required eight stages of the claimed invention and therefore, it appears that the width of the heat transfer tubes of three stages of JPN '647 falls within the broad ranges of 3000 mm or less of the claimed invention.

5. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over JPN '647 in view of Japanese Publication Number 2000-320998 ("JPN '998"). JPN '647 discloses a GGH recovery device and GGH heater re-heater but fails to disclose dust removers and differential pressure gauges and/or thermometers in front and back of the bundles and control devices to activate the dust removers when the measured differential pressure and measured temperature is set higher or lower than the set point. JPN '998 teaches that a controller 100 (Fig. 1) controls the operation of the soot blower (9) based on the measured pressure drop (via pressure gauges 21-24) and measured temperature (via thermometers 25-28) in the heat recovery unit (7) and reheater (8). The control device (100) of JPN '998 provides the advantage of efficient dust removal and thereby, improves heat transfer for the heat transfer tubes (Sections 0015-0018). Thus, it would have been obvious in view of JPN '998 to one having ordinary skill in the art to provide a control device with pressure gauges and thermometers as taught by JPN '988 in the device of JPN '647 in order to provide a control means for controlling the operation of the dust removers and thereby, improves heat transfer.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tom P. Duong whose telephone number is (571) 272-2794. The examiner can normally be reached on 8:00AM - 4:30PM (IFP).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on (571) 272-1444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Tom Duong
August 15, 2007